Proposed Amendment between California Energy Commission and The Regents of the University of California, - CIEE

Title: Development of Fault Current Controller Technology
Amount: $0.00
Term: 9 months
Performing Inst: The Regents of the University of California, - CIEE
Contact: Jamie Patterson
Committee Meeting: 6/1/2010

Recommendation

Approve this agreement with The Regents of the University of California - CIEE for a no-cost time extension of nine months. Staff recommends placing this item on the consent calendar of the Commission Business Meeting. The original agreement was for $1,175,000 for 38 months. This agreement will extend the contract to 47 months.

Issue

Additional time is needed to fully complete the project that is in process. This project experienced unforeseen difficulties with the development efforts by the vendors to design, construct and field-test their Fault Current Controller (FCC) prototypes. The additional engineering design, prototype construction, laboratory testing, and preparation for field testing resulted in a delay in the scheduled date for the field installation. Not allowing this project the additional time will result in this critical research not being completed and may create the need to generate and process new contracts to complete the required research. These delays are considered outside the control of the researchers.

Background

The overall electric current loading on the transmission system has been increasing due to growth in demand for electricity. As a result, the potential fault current magnitudes at locations throughout the transmission system are, in many instances, exceeding the capability of existing protection systems (circuit breakers) to interrupt the faults safely and reliably. Consequently, a utility must upgrade the breakers or reconfigure its system to reduce the available fault current. Both solutions are costly and impractical in many cases; and the latter approach, especially, will adversely affect system reliability and power transfer capability. Technologies are becoming available that have the potential to limit or control fault currents in the electrical system, thereby avoiding the expense of replacing existing equipment. However, these technologies are still in the development stage, and comprehensive testing, especially in utility in-service environments, is crucial to their eventual success.

This project was expressly designed to provide the kind of real-world testing of a new technology that will facilitate the development and implementation of a critically-needed technology for the transmission system of today, and even more so for the future Smart Grid. Without this technology, it will be much more difficult and costly to maintain system reliability and capacity, to integrate large numbers of new renewable plants, and to enable the multitude of Smart Grid technologies that are envisioned.

Proposed Work

The proposed research will determine the desired performance criteria for fault current controller technology, then develop two leading prototype fault current controllers and test against the criteria. The project will evaluate the performance, cost effectiveness and reliability of each technology, and will

consider the advantages of passive versus active devices. The outcomes will also provide guidance for future development of higher voltage controllers. Southern California Edison will perform the tests in actual substation facilities, in contrast to lab testing, so that practical considerations such as the ease of transport, installation issues, and maintenance requirements can be assessed. SCE will provide in-kind engineering and technical services valued at approximately $500K in the performance of this project.

The additional time will allow the field testing of the prototype FCC to be performed for a full year, as originally envisioned for this technology, so that the device "sees" and responds to the full spectrum of utility faults and disturbances. This is necessary to ensure that the technology can be fully evaluated with regard to installation practices, fault-controlling performance, in-service reliability, and operations and maintenance (O&M) requirements.

Justification and Goals

This project "[has] the potential to enhance transmission and distribution capabilities" (Public Resources Code 25620.1.(c)(3)).

This will be accomplished by:

- Developing two prototype fault current controllers
- Determining the performance criteria for fault current controller technology
- Test the controllers against the criteria